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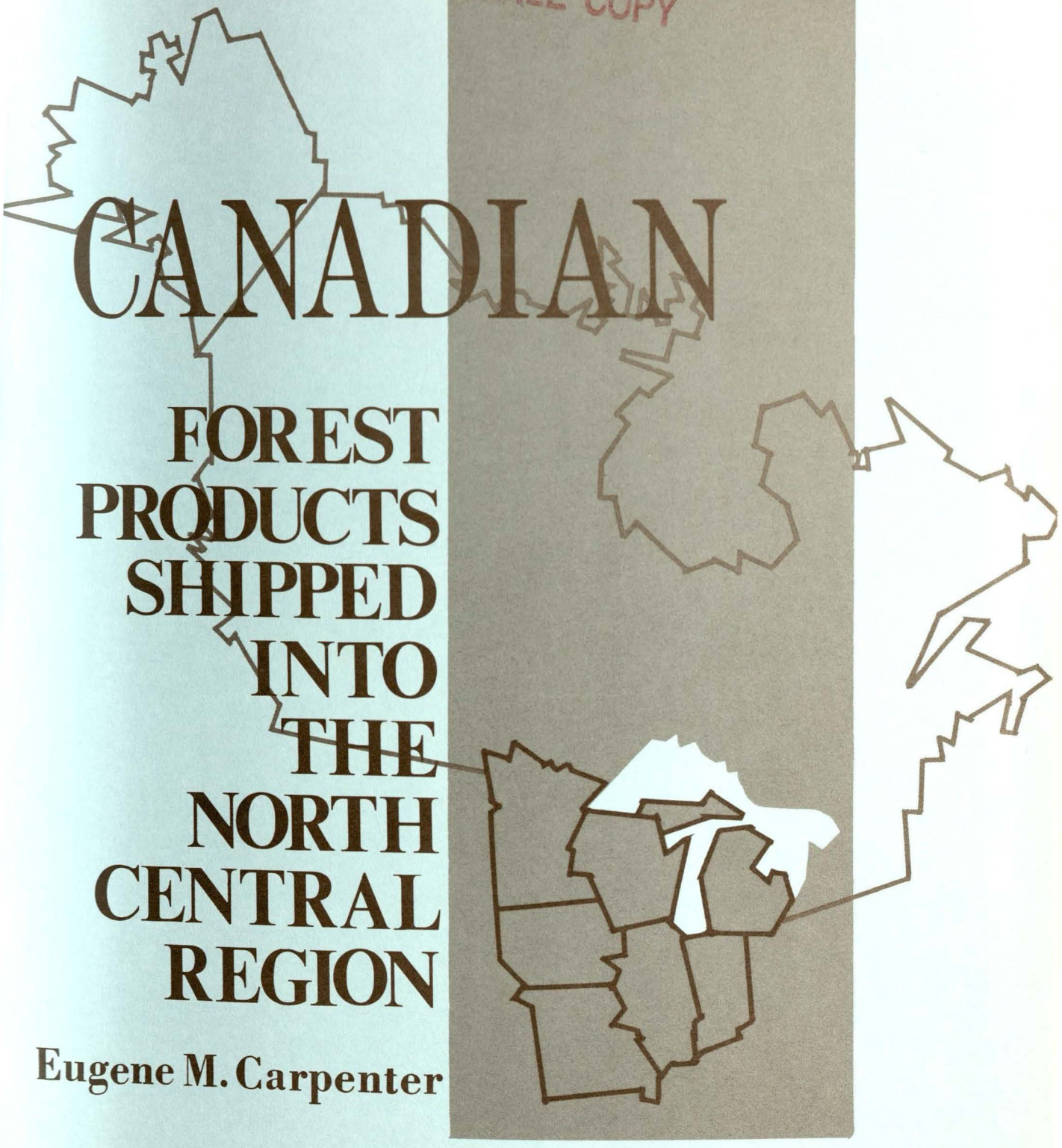

CANADIAN FOREST PRODUCTS SHIPPED INTO THE NORTH CENTRAL REGION

Eugene M. Carpenter

NORTH CENTRAL FOREST EXPERIMENT STATION • FOREST SERVICE • U.S. DEPARTMENT OF AGRICULTURE

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HIGHLIGHTS

The increased use of domestic aspen and other hardwoods and expanded importation of softwood woodpulp in recent years have caused a significant decline in imports of Canadian pulpwood and have contributed to the steady growth of the Lake States paper industry. However, it is unlikely that the Lake States forest resource can compete for a much larger share of the market for most major forest products imported from Canada.

Total U.S. imports of forest products from Canada in 1969 were valued at $2.138 billion, which was 79 percent of the total $2.706 billion of forest products imported from all foreign countries. Corresponding figures for 1965 were $1.599 billion and $1.941 billion, or increases of 34 and 39 percent, respectively, in terms of current dollars.

The value of Canadian forest products imported through North Central Customs Districts was $906.5 million in 1969, up 33 percent from the $679.5 million in 1965. The north-central region received slightly more than 42 percent of U.S. forest product imports from Canada in 1969 (figure 1, table 1). These value data represent the market value in the foreign country in U.S. dollars and exclude freight, insurance, and duty charges.

Three commodities — newsprint, softwood lumber, and woodpulp — accounted for 89 percent of the value of all forest products imported from Canada into the United States, and 87 percent of the value of all Canadian forest products that came into the north-central region in 1969. Shingles and shakes, uncoated book paper, hardwood veneer, hardwood lumber, wood siding and pulpwood and chips made up most of the remainder. The volume of north-central region imports decreased from 1960 to 1969 for pulpwood, birch plywood, drilled and/or treated lumber, wood siding, and sulfite and soda pulps. However, importation of these products increased: newsprint, uncoated book paper, wrapping paper, hardboard, softwood lumber, shingles and shakes, building board, birch and maple veneer, hardwood flooring, hardwood lumber, poles and piling, and sulfate pulp. Imports of groundwood and specialty pulps have remained about the same in spite of significant increases in U.S. production.

DISCUSSION AND PERSPECTIVE

Canada historically has been and will continue to be an important source of forest products for the north-central region. This report summarizes recent trends in the importation of various forest products from Canada and approximates the volumes of these products that have a first destination within the region. Also, it indicates the volumes of materials shipped through the area and the region to which these products were apparently destined. Thus, it documents the degree of dependence that the area places on the Canadian forest resource and the importance of this international trade to the economy of the region. At the same time it may suggest opportunities for increasing the utilization of local forest resources, particularly for products that have been increasingly imported and for which the local forest resource could be successfully utilized.

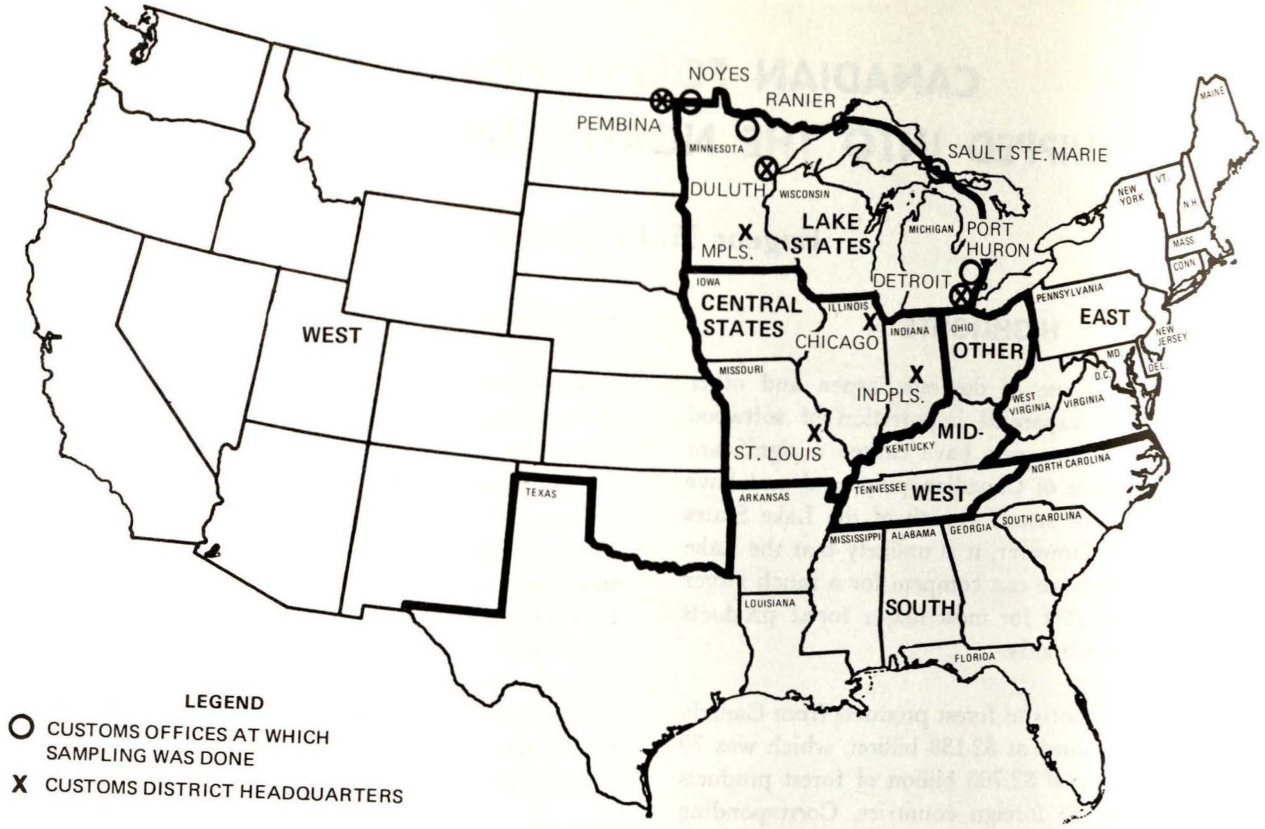

Figure 1. — *Regions of destination and Customs offices at which sample data were collected. The north-central region includes Lake States and Central States.*

The problem of forest resource underutilization in the region is basically a need for expanded market opportunities for surplus volumes of hardwood growing stock and small sawtimber — trees which can be used in the manufacture of fiber products such as woodpulp, hardboard, and particleboard, or for pallet-type lumber and railroad ties.[1] Of the softwoods, balsam fir is vastly undercut. The most recent forest survey of Michigan shows that the growing stock harvest for every species except jack pine could be increased.[2] The annual cut of balsam fir, hard and soft maple, aspen, and white birch is well below the allowable cut[3] and should be increased considerably. Although up-to-date forest survey information is not available for Minnesota and Wisconsin, it appears that surplus hardwood poletimber[4] is available in Wisconsin, and that surpluses of aspen, white birch, and balsam fir are available in Minnesota.

The availability of surplus saw log material is limited to certain species and survey districts; for example, northern white cedar in Michigan's eastern Upper Peninsula and aspen in northern Minnesota. Most saw log surpluses are not large enough to cause

[1] *Growing stock is defined as all live trees of any size except rough and rotten trees.*

[2] *Chase, Clarence D., Ray E. Pfeifer and John S. Spencer, Jr. The growing timber resource of Michigan. USDA For. Serv. Resour. Bull. NC-9, 62 p., illus. North Cent. For. Exp. Stn., St. Paul, Minn. 1966. This and other timber resource reports for the north-central States can be obtained from the North Central Forest Experiment Station, Folwell Avenue, St. Paul, Minn.*

[3] *Allowable cut is the average net volume that should be cut annually on commercial forest land to improve the tree stocking and bring about a better distribution of age classes.*

[4] *Poletimber trees are live trees of commercial species at least 5.0 inches d.b.h (diameter breast height) but smaller than sawtimber. Sawtimber trees contain at least one 12-foot saw log, and must be 9.0 inches d.b.h. for softwoods and 11.0 inches d.b.h. for hardwoods.*

Table 1. — *Value of U.S. and north-central region imports[1] of Canadian forest products, 1965 and 1969*

Commodities	U.S. imports from Canada				North Central imports from Canada			
	1969		1965		1969		1965	
	Rank	Value	Rank	Value	Rank	Value	Rank	Value
		Million dollars		Million dollars		Million dollars		Million dollars
Newsprint	1	903.5	1	762.2	1	313.4	1	268.6
Softwood lumber	2	517.4	3	294.7	2	253.8	3	150.1
Woodpulp	3	482.5	2	363.1	3	226.6	2	165.0
Shingles and shakes	4	42.9	4	29.0	4	24.0	6	12.8
Uncoated book paper	5	35.8	8	15.5	5	22.0	7	10.4
Hardwood lumber	6	32.0	5	27.3	7	15.0	5	13.8
Hardwood veneer	7	20.9	6	26.3	6	16.9	4	24.0
Pulpwood and chips	8	13.9	7	18.2	9	4.7	8	6.6
Siding	9	10.8	9	12.3	8	5.9	9	6.4
Posts, poles, and piling	10	7.0	12	5.2	10	3.9	12	2.9
Drilled, treated or glued	11	6.1	13	4.4	11	3.7	11	3.2
Plywood and veneer panels	12	5.0	10	6.7	12	2.9	10	4.1
Waste and scrap paper	13	4.5	11	5.4	16	1.5	13	1.8
Logs	14	4.5	18	1.7	17	1.3	16	1.0
Fence pickets and palings	15	3.7	19	1.6	--	(2/)	--	(2/)
Building board	16	3.5	16	2.2	14	1.7	18	.8
Wrapping paper	17	3.4	17	1.8	13	2.3	15	1.4
Hardboard	18	3.3	14	3.3	15	1.6	14	1.5
Softwood veneer	19	2.5	--	.8	--	(2/)	--	(2/)
Packing boxes and crates	20	2.4	--	1.2	--	(2/)	--	(2/)
Wallpaper	21	2.3	--	.9	--	(2/)	--	(2/)
Paper board and shoe board	22	2.2	--	.8	--	(2/)	--	(2/)
Crepe paper	23	2.1	--	.2	--	(2/)	--	(2/)
Hardwood flooring	24	2.0	15	2.4	18	.9	17	.9
Lath	25	1.8	20	1.3	19	.8	19	.4
Hardwood moulding	26	1.3	--	.1	--	(2/)	--	(2/)
Softwood plywood	27	1.1	--	(2/)	--	(2/)	--	(2/)
Softwood moulding	28	1.0	--	.6	--	(2/)	--	(2/)
Miscellaneous	--	18.2	--	9.8	--	3.4	--	3.6
Total 3/		2,137.9		1,599.3		906.5		679.5

1/ Source: U.S. Bureau of the Census, U.S. Imports for Consumption and General Imports, TSUSA Commodity and Country Report FT 246 Annual.
2/ Included in miscellaneous.
3/ Totals may not add because of rounding.

concern about underutilization. However, short-lived species such as aspen and balsam fir do not develop into large sawtimber trees on average sites, and must be harvested soon after reaching the sawtimber size class. Lack of markets can cause heavy losses of mature timber in these species due to insects and disease.

Underutilization of the forest resource leads to imbalances in stand age-class distribution, making it difficult to practice sustained yield forestry. Also, the forest manager is deprived of opportunities for improvement cuts and thinnings that are needed to enhance the growth and value potential of the forest. Equally important is the degradation of wildlife habitat, which occurs in the absence of frequent harvest and regeneration to provide feeding and nesting areas.

Many upper Lake States areas suffer from chronic unemployment and out-migration of the labor force because of inadequate job opportunities — a situation aggravated by periods of economic recession. More complete utilization of the forest resource could allow local industries to expand production and offer increased job opportunities. It may also be possible to increase the use of regional manpower in operations that add to the value or utility of certain imported materials. Exploitation of these service opportunities on an in-transit basis can be as important to the economic development of an area as expanded resource utilization.

Proximity to market should not be a problem in expanding use of the local resource, because imports usually require a much longer shipping distance. Success might depend more on a competitive labor

force and transportation system plus an efficient production facility.

In summary, imports of several products that could be supplied by the north-central region's forest resource have increased. Attention should be concentrated on products less selective of species or grades, such as fiber products or particleboard, which can be produced from timber species with allowable cuts still well above actual removals.

PROCEDURE

We recorded the destination of Canadian forest products imported through north-central entry points in 1965. Factors developed from these data were then applied to 1969 import data with the assumption that there were no significant shifts in shipping patterns since 1965. Obviously, for some products further interregional distribution may be made. The products are presented in descending order of importance in terms of dollar value of shipments to the north-central region, and are analyzed with regard to their potential for replacement by the local forest resource.

The U.S. Customs Districts considered as part of the north-central region for recording entries in 1965 were: No. 34 North Dakota (Pembina), No. 35 Minnesota (Minneapolis), No. 36 Minnesota (Duluth), No. 37 Wisconsin (Milwaukee), No. 38 Michigan (Detroit), No. 39 Illinois (Chicago), No. 40 Indiana (Indianapolis), and No. 45 Missouri (St. Louis). For a detailed list of entry ports within these Districts see: *Schedule D, Code Classification of United States Customs Districts and Ports,* U.S. Department of Commerce, Bureau of Census.

Time series data for this study were obtained from Bureau of Census summaries of information collected by the Bureau of Customs.[5] To determine destinations, a sample of Customs files of 1965 import declaration forms was taken. Beginning with the first entry in January and July, the apparent first destination of every entry was recorded for commodities having a low total import volume. For newsprint and lumber the destination of every tenth entry was recorded, and for woodpulp, pulpwood, siding, and shingles and shakes the destination of every fourth entry was recorded.

Because of the large number of entry forms at some offices compared with others, a variable time period was covered by the sample at each office. In some cases the entire year was accounted for; in others the period was as limited as January through March, or July through September. Even though a shorter period of time was covered at some offices, a larger volume of material was usually included in the sample. For products that moved in large quantity through several different entry points, there was no discernible difference in destination patterns. The two starting points (January and July) were used to reduce the possibility of bias for commodities that might have seasonal shipping patterns and for which the entire year could not be covered because of time limitation.

Destination regions identified were the Lake States, Central States, Other Midwest, East, South, and West (fig. 1). The Lake States and Central States were then combined to make up the North-Central Region.

The study covered all modes of transportation; however, most of the freight moved by rail. Several assumptions relating to these traffic movements need explanation. Because railroads tend to keep freight on their own lines as much as possible, and because of the pattern of railroad development, it was assumed that most shipments originating in western Canada that are destined for the north-central region, the East, or South, would enter the U.S at points no farther west than central North Dakota. Furthermore, North Dakota entries generally are funneled into the north-central region because the rail lines are oriented toward Minneapolis and/or Duluth, Minnesota. Also, traffic coming from eastern Canada and destined for the north-central region would enter no farther east than the Detroit, Michigan, District. The Customs Districts included in the north-central region but not sampled for destination were those having no land border points. Import volumes in these Districts were extremely small, and were assumed to have been consumed within the region.

[5] *The specific summaries used as data sources were the IA 253 Annual, Tariff Schedules of the U.S. Annotated, and FT 246 U.S.* Imports for Consumption and General Imports, *both publications of the Bureau of Census, Department of Commerce. These show volume and value of imports by Customs District, exporting country, and TSUSA commodity classes.*

Schedule 2 of the Tariff Schedules of the United States Annotated (TSUSA), shown below, relates the broad products classification for wood, paper, and printed matter imported into the U.S. Several categories were eliminated from the analysis, including all of Part 2 and Part 5. Some subcategories in the remaining parts were eliminated because they were not applicable to the study, because product volumes were extremely low, or to avoid disclosure of individual firm data.

Schedule 2
Wood and Paper, Printed Matter

- Part 1. Wood and wood products.
  - A. Rough and primary wood products, wood waste.
  - B. Lumber, flooring, and mouldings.
  - C. Densified wood and articles thereof.
  - D. Wood containers.
  - E. Miscellaneous products of wood.
  - F. Articles not specifically provided for, of wood.
- Part 2. Cork and cork products, bamboo, rattan, willow and chip, basketwork, wickerwork, and related products of fibrous vegetable substances.
- Part 3. Wood veneers, plywood and other wood-veneer assemblies, and building boards.
- Part 4. Paper, paperboard, and products thereof.
  - A. Papermaking materials.
  - B. Paper and paperboard, in rolls and sheets, not cut to size or shape.
  - C. Paper and paperboard cut to size or shape, articles of paper and paperboard.
  - D. Articles not specifically provided for of pulp, of papier-mache, of paper, or of paperboard.
- Part 5. Books, pamphlets, and other printed and manuscript material.

COMMODITY SITUATION
Newsprint

Newsprint is by far the most important wood product imported from Canada into the U.S. in terms of dollar value. While imports held level during the early 1960's, there was a slight increase in volume toward the end of the period (fig. 2). Canada supplies more than 95 percent of the total newsprint imports, with Finland supplying the balance; these total imports have increased by 25 percent since

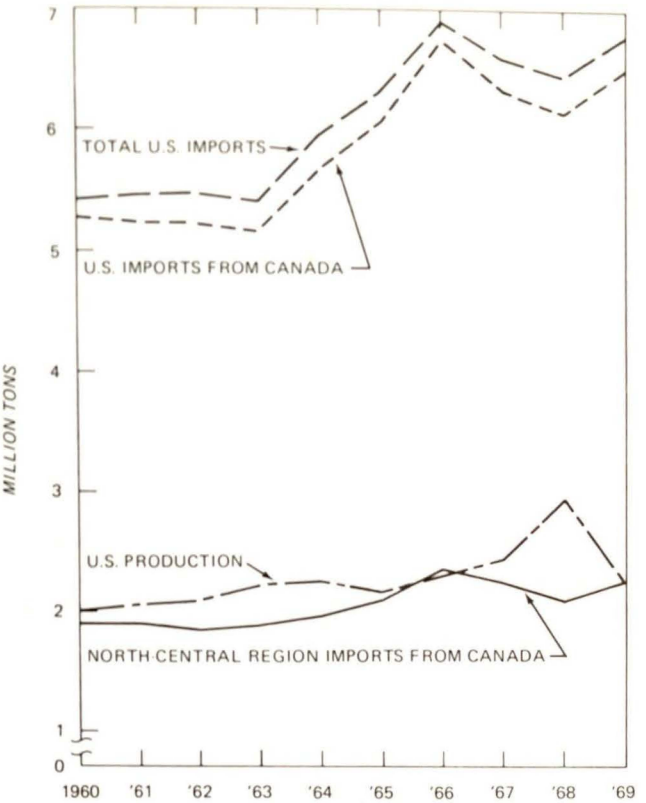

Figure 2. — *Production and imports of newsprint, 1960-1969. Source for U.S. production is: Current Industrial Reports, Pulp, Paper and Board. Ser. M26A-13. USDC Bureau of the Census, Washington, D.C.*

1963. Three-quarters of the Canadian newsprint entering the north-central region had a first destination within this region; almost half of the total went to the Central States. The Other Midwest and West areas received 15 and 8 percent, respectively. Minor amounts went to the South and East.

The following tabulation shows the destination of the newsprint imported in 1969 as estimated from a 5 percent sample of the 2.1 million tons imported in 1965.

First destination	*1969 Volume (M tons)*	*Percent*
Lake States	619.6	27.4
Central States	1,071.9	47.4
North Central	[1,691.6]	[74.8]
Other Midwest	339.2	15.0
East	22.6	1.0
South	18.1	.8
West	190.0	8.4
Total	2,261.4	100.0

Lake States timber has limited opportunity for wide-scale use in manufacture of newsprint. In the first place most newsprint is made from unbleached softwood pulp, a substantial quantity of which is now imported to supplement local supplies. Although surplus balsam fir is available, it is not competitive because of its low pulp yield. Surplus volumes of other softwood pulpwood species are not available.

Secondly, many large users of newsprint in the U.S. have substantial investments in paper-making facilities in Canada; thus, the market share available to independent newsprint manufacturers is much less than it appears from gross consumption data. Furthermore, now that U.S. southern pine newsprint mills have established their market position in areas where they have a definite advantage, future domestic growth will be largely limited to normal per capita increases.

Newsprint made from hardwood-based pulps, although technically feasible, apparently does not have sufficient economic appeal to Lake States mills to encourage expansion of production facilities to include this line of paper.

Softwood Lumber

United States imports of Canadian softwood lumber were approximately 16 percent of U.S. production during most of the study period, but climbed to 19 percent in 1969. One-half of these imports entered through north-central border points and have totaled between 2 and 2¾ billion board feet annually since 1961 (fig. 3). Most is shipped as dressed lumber. In 1969 spruce accounted for 58 percent of the 2.76 billion board feet of regional imports, compared with 44 percent of the total U.S. imports of Canadian lumber.

A significant portion of this lumber is shipped unsold and is routed to a furtherance point. The two most popular first destinations were Marshalltown, Iowa, and Gary, Indiana. In our 1965 sample they accounted for approximately two-thirds of the 906.9 million board feet shipped on a "for-furtherance" basis. Other common marshalling points were Minneapolis, Minnesota, Spooner and Hudson, Wisconsin, and Chicago and East St. Louis, Illinois. These "for-furtherance" carloads are often sold while enroute and may be diverted in any direction. Thus it was

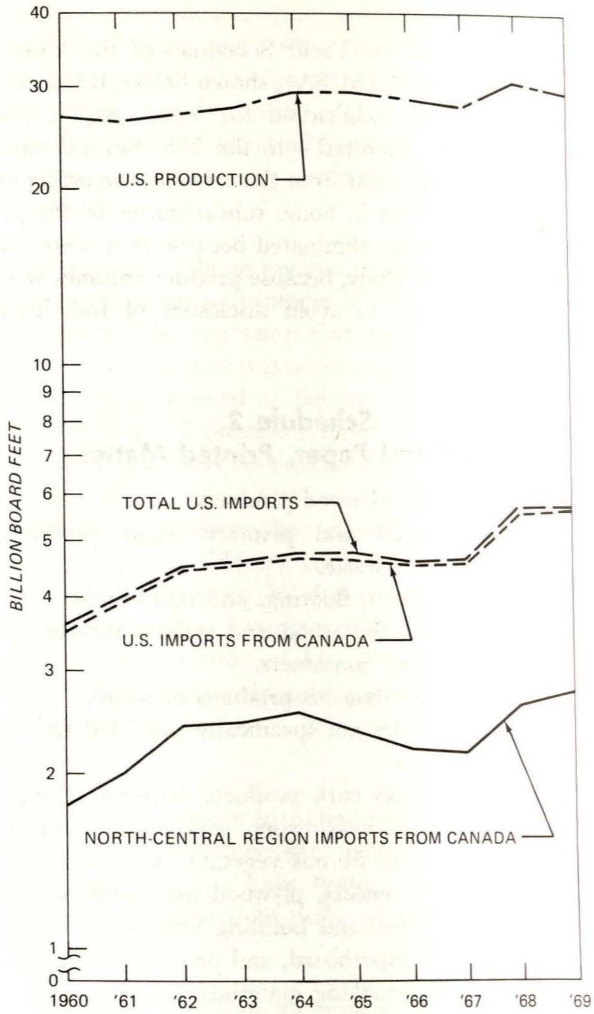

Figure 3. — *Production and imports of softwood lumber, 1960-1969. Regional imports, U.S. imports from Canada, and total U.S. imports include spruce, white and red pine, pine NES (principally jack, ponderosa, and lodgepole), Douglas-fir, hemlock, larch, and cedar. The source for U.S. production is: Current Industrial Reports, Lumber Production and Mill stocks. Ser. M-24T. USDC Bureau of the Census, Washington, DC.*

impossible to determine an apparent region of final destination for this volume. However, it is likely that it was distributed regionally in approximately the same proportions as the volume for which an apparent regional destination is known. It is possible that large wholesalers may later distribute or reroute a portion of the lumber to other regions. It is felt, however, that the major portion is utilized within the north-central region.

The bulk of Canadian lumber entered through Dakota or Minnesota points, although a major portion of the white and red pine came into the region through Michigan. Most of the material destined for the West Region went to one of the northern or central plains States (table 2).

Those species accounting for 84 percent of imports — spruce, Douglas-fir, and pine NES (not elsewhere specified, largely lodgepole and jack pine) — are basically used for construction lumber. The surplus softwood sawtimber resource of the Lake States is not large and sawtimber is being cut at close to the feasible limit under present levels of forest management. Thus, while opportunities may be present for increased cutting in some areas, it is obvious that the north-central area is dependent on imports from the western and southern U.S. and Canada for a major portion of its construction lumber needs.

Table 2. — *Destinations of regional imports of softwood lumber from Canada, 1969 volume*[1]

(In million board feet)

Species	First destination							
	Lake States	Central States	North Central[2]	Other Midwest	East	South	West	Total[3]
Spruce	87.7	430.5	518.2	3.7	0.5	--	--	522.5
	232.1	226.7	458.9	148.4	316.7	143.1	14.6	1,081.6
White and red pine	--	--	--	--	--	--	--	--
	32.9	2.0	34.8	.8	--	--	--	35.6
Pine, N.E.S.[4]	26.2	60.5	86.6	1.7	(5)	--	5.0	93.2
	60.9	44.9	105.8	24.7	65.3	50.6	2.6	249.3
Douglas-fir	101.8	110.1	212.8	6.4	2.0	--	--	215.2
	34.9	21.5	56.4	8.9	38.8	26.7	6.4	137.0
Fir, N.E.S.	3.7	15.7	19.3	--	--	--	--	19.3
	12.5	.9	13.4	4.6	.6	4.7	.6	23.8
Hemlock	10.2	53.1	63.4	.7	--	--	.4	64.5
	25.3	9.8	35.1	6.3	10.4	8.9	1.7	62.4
Larch	5.5	13.2	18.7	--	--	--	--	18.7
	1.7	.1	1.8	3.4	--	--	--	5.2
Cedar	22.3	15.8	38.1	2.8	--	--	.5	41.5
	8.8	4.0	12.0	26.7	24.5	108.5	16.9	189.3
Softwood, N.E.S.	--	--	--	--	--	--	--	--
	.1	--	.1	--	--	--	--	.1
Subtotal	310.9	722.0	1,032.9	9.3	3.7	--	5.3	1,051.2
	391.9	286.2	678.1	208.8	429.2	345.2	46.6	1,707.9
Total[3]	702.7	1,008.1	1,710.8	218.0	432.9	345.2	51.9	2,759.1

1/ Based on a sample of 1965 shipments that included 106,968 M bd. ft. or 4.5 percent of all regional imports of Canadian lumber. Top figures represent lumber shipped to a furtherance point for redistribution, bottom figures to an apparent first destination.

2/ The north-central region is the sum of the Lake States and Central States.

3/ Totals may not add because of rounding.

4/ N.E.S. = Not elsewhere specified.

5/ Less than 50,000 bd. ft.

Woodpulp

Except for sulfate, the volume of Canadian woodpulps entering the north-central region from 1960 to 1969 has remained relatively static or has declined (figs. 4-8). Regional sulfate imports have more than doubled, rising from 579.7 thousand tons to 1.43 million tons; in 1969 they represented 80 percent of north-central woodpulp imports from Canada. Woodpulp imports for the country as a whole have exhibited similar trends. U.S. production has increased substantially during the study period for sulfate, groundwood, and special alpha and dissolving pulps. Sulfite production has remained between 2.5 and 2.7 million tons annually, while soda pulp has decreased by nearly 50 percent to 240 thousand tons in 1969.

Regional destinations for north-central imports vary by type of pulp (table 3). In 1969 nearly 90 percent of the north-central regional sulfate woodpulp imports were softwood-based, and two-thirds had a first destination in the Lake States; almost all of the relatively small amount of hardwood-based sulfate woodpulp imports had a first destination in the Lake States. At the same time, Lake States pulpmills have increased their production of hardwood woodpulp significantly. Nearly all the groundwood and approxi-

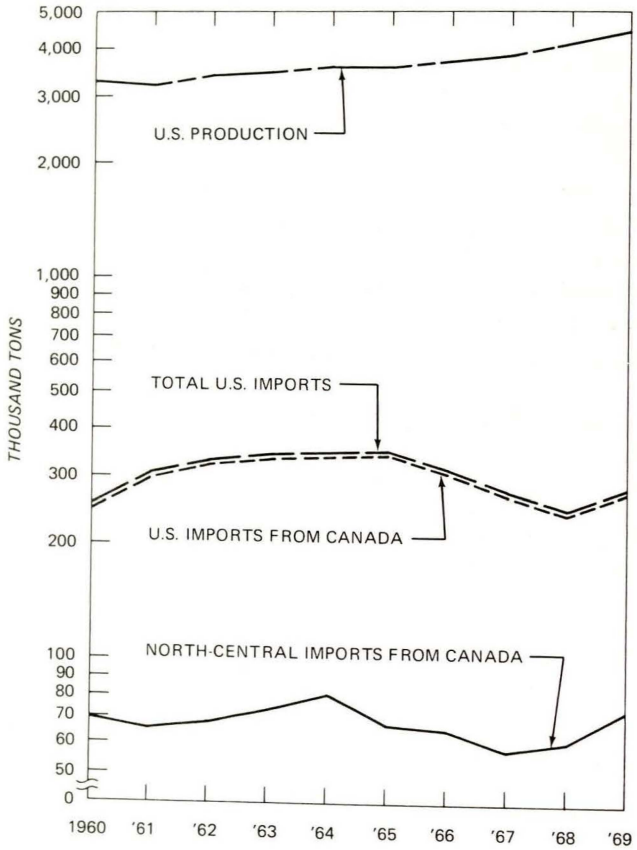

Figure 4. — *Production and imports of groundwood pulp, 1960-1969. The source for U.S. production is: Current Industrial Reports, Pulp, Paper and Board. Ser. M26A-13. USDA Bureau of the Census, Washington, D.C. Does not include mixtures and screenings and pulp NSPF of 24,362 tons.*

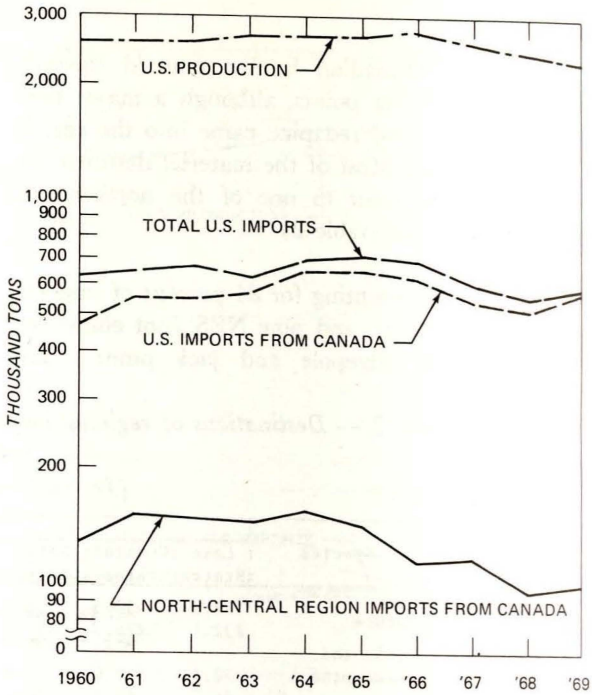

Figure 5. — *Production and imports of sulfite pulp, 1960-1969. The source for U.S. production is: Current Industrial Reports, Pulp, Paper and Board. Ser. M26A-13. USDC Bureau of the Census, Washington, D.C. Does not include mixtures and screenings and pulp NSPF of 24,362 tons.*

mately three-quarters of the sulfite pulp had a first destination in the north-central region. Three-quarters of the alpha and dissolving pulp had a first destination outside of the region, and no soda pulp was included in the sample.

The pulp and paper industry of the north-central area has taken an encouraging stride in the direction of utilizing the surplus hardwood resource through advances in hardwood pulping technology and increased expertise in using a variety of pulps in the paper furnish.

Table 3. — *First destination of regional imports of Canadian woodpulp, 1969*[1]
(In short tons)

Item	Groundwood	Sulfite	Sulfate	Alpha and dissolving	Total
Lake States	2/ D	D	948,233	D	1,091,411
Central States	D	D	62,719	D	113,711
Total North Central	71,765	74,356	1,010,952	48,048	1,205,121
Other Midwest	D	22,885	312,308	D	364,127
East	D	D	46,818	D	106,520
South	D	D	58,817	D	112,911
West	D	D	5,273	D	5,419
Total	73,751	98,682	1,434,168	187,498	1,794,099
Percent volume in sample	33	8	8	10	
Percent of pulp with first destination in:					
Lake States	D	D	66	D	
Central States	D	D	4	D	
North Central States	97	75	70	26	

1/ Based on a sample of 1965 woodpulp imports.
2/ D = Data withheld to avoid disclosure of individual company volumes.

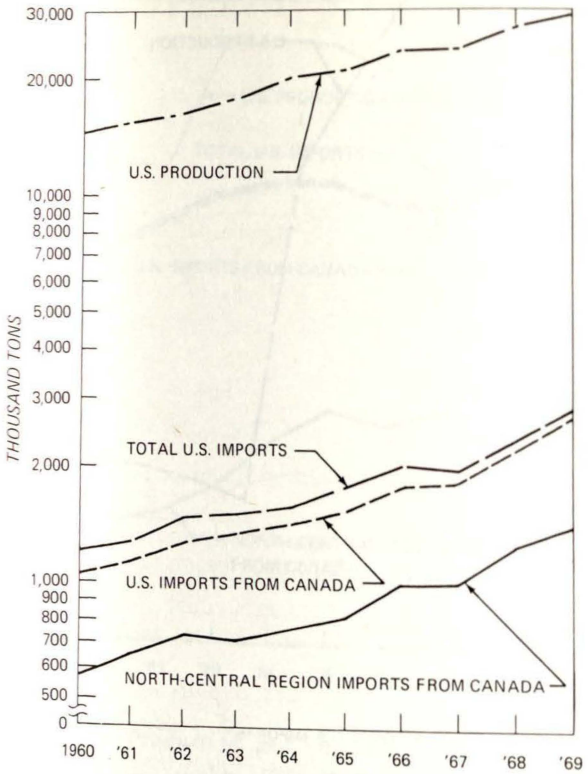

Figure 6. — *Production and imports of sulfate pulp, 1960-1969. The source for U.S. production is: Current Industrial Reports, Pulp, Paper and Board. Ser. M26A-13. Does not include mixtures and screenings and pulp NSPF of 24,362 tons.*

As the Lake States softwood pulpwood resource comes closer to a full harvest of the allowable cut, the Canadian softwood woodpulp imports are needed to allow expansion of the pulp and paper capacity within the region; the surplus hardwood resource can support an increased rate of expansion in several survey districts. On the other hand, the softwood resource could be increased significantly through more intensive forest management.

Shingles and Shakes

Imports of shingles and shakes from Canada, which accounted for 99.9 percent of all shingle and shake imports, have amounted to approximately 60 percent of U.S. production since 1963. The trend in imports has been slightly upward during the study period (fig. 9) and over 95 percent of these imports have been red cedar.

Shingle and shake imports from Canada coming through the north-central region, which represent approximately 40 percent of the total, are distributed regionally as follows. The 1965 sample comprised 4 percent (50,722 squares) of the regional import volume.

First destination	*1969 Volume (Squares)*	*Percent*
Lake States	9,193	0.7
Central States	30,612	2.2
North Central	[39,805]	[2.9]
Other Midwest	3,165	.2
East	1,032,099	74.3
South	270,926	19.5
West	5,962	.4
For furtherance:		
Lake States	1,446	.1
Central States	34,861	2.5
Total	1,388,264	99.9

The comeback of wood shingles and shakes is a result of the pleasing rustic appearance now popular in high-quality homes, the impressive revival of the mansard roof design in homes, apartments, and commercial buildings, and building code changes to incorporate fire retardant construction techniques. Most are made from red cedar, and it is doubtful if Lake States species could successfully compete in this market.

Uncoated Book Paper

Categories of paper products in the *Tariff Schedules of the United States Annotated* (TSUSA) are based on a variety of factors and few individual import categories amount to a significant dollar value.[6] Newsprint is one exception. However, two other categories are reasonably important, although they are minor when compared with U.S. production. These are uncoated book printing paper and wrapping paper.

Uncoated book paper includes those book and printing papers not cut to size or shape and with no surface treatment, coloring, or embossing. It excludes

[6] *Tariff schedules of the United States annotated (1969), U.S. Tariff Commission, Washington, D.C. T.C. publ. 272, 1968.*

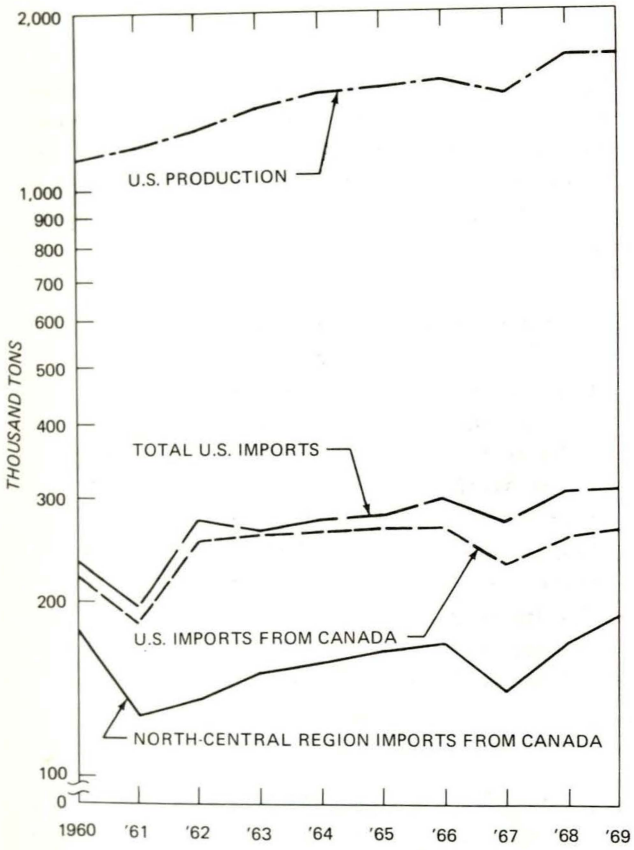

Figure 7. — *Production and imports of alpha and dissolving pulp, 1960-1969. The source for U.S. production is: Current Industrial Reports, Pulp, Paper and Board. Ser. M26A-13. USDC Bureau of the Census, Washington, D.C. Does not include mixtures and screenings and pulp NSPF of 24,362 tons.*

cover paper, India or bible paper, and newsprint. Ninety-five percent of these imports are papers containing 25 percent or more groundwood pulp. Undoubtedly, a high proportion is softwood-based. Imports from Canada were valued at $15.5 million in 1965, $26.25 million in 1967, and $35.78 million in 1969. The increase in these imports has been impressive since 1963 (fig. 10). Regional imports accounted for approximately two-thirds of the total from Canada, which in turn amount to approximately 90 percent of the total U.S. imports of uncoated book paper.

More than 60 percent of the uncoated book paper imported through regional points from Canada in 1969 had a first destination in the north-central region.

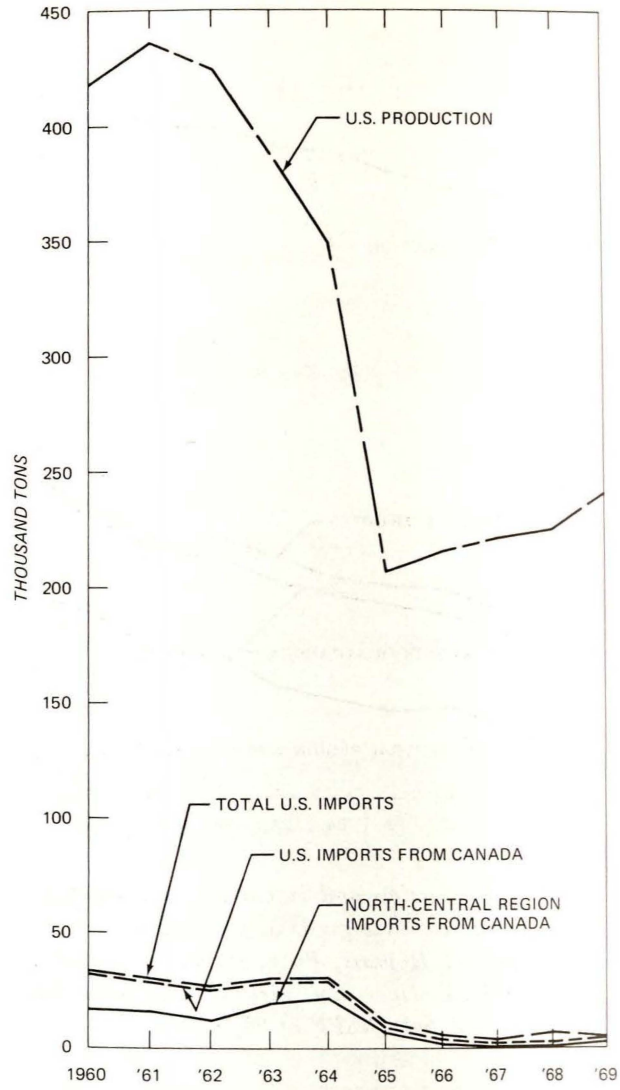

Figure 8. — *Production and imports of soda pulp, 1960-1969. The source for U.S. production is: Current Industrial Reports, Pulp, Paper and Board. Ser. M26A-13. USDC Bureau of the Census, Washington, D.C. Does not include mixtures and screenings and pulp NSPF of 24,362 tons.*

First destination	*1969 Volume* (Tons)	*Percent*
Lake States	19,553	15.2
Central States	59,046	45.9
North Central	[78,599]	[61.1]
Other Midwest	28,172	21.9
East	5,146	4.0
South	7,204	5.6
West	9,519	7.4
Total	128,640	100.0

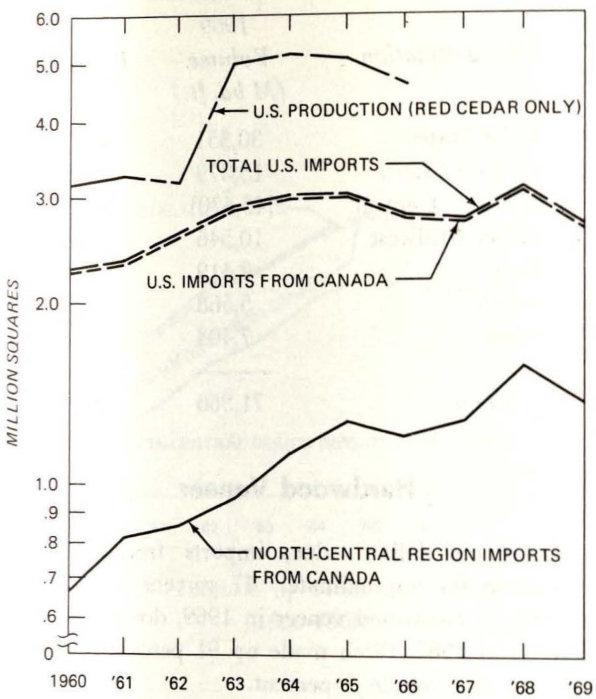

Figure 9. — *Production and imports of shingles and shakes, 1960-1969.*

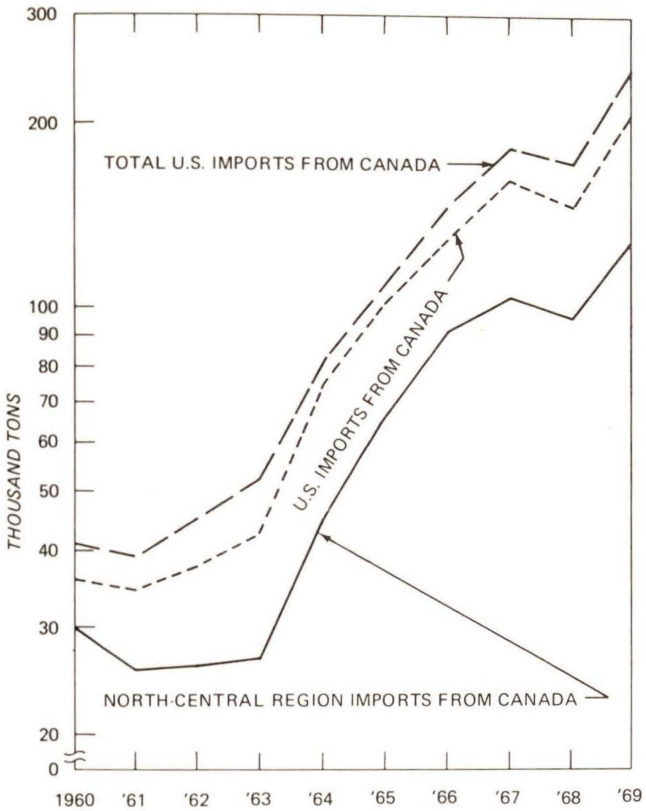

Figure 10. — *Imports of uncoated book paper, 1960-1969.*

The 1965 sample comprised 6 percent of the regional import volume.

As with newsprint, the extent to which Lake States surplus hardwoods could be utilized in book paper production would hinge on how successfully aspen and dense hardwood pulps could replace softwood pulps in the furnish. The prospects are not overly bright considering the extra cost of bleaching hardwood pulp, although bleached hardwood grades are increasingly being used with softwood grades in fine papers. In addition, the tariff on uncoated book paper under the Kennedy Round of 1967 will be reduced from 17 cents per pound and 4 percent ad valorem to 8 cents and 2 percent by 1972. Obviously this will favor increased imports only to the extent that tariffs have been a deterrent to international trade in the past.

Hardwood Lumber

The study included hardwood species indigenous to the U.S. and Canada and excluded foreign and tropical woods, except for those miscellaneous species lumped into the category "Hardwood, Not Elsewhere Specified." Imports of Canadian hardwood lumber showed a slightly increasing trend during the study period for both the U.S. and the north-central region; imports for the U.S. amounted to between 1½ to 2 percent of domestic production (fig. 11). The sharp upturn in total U.S. imports in 1968 and 1969 is the result of significant increases of miscellaneous tropical hardwoods from Brazil, Colombia, several other South American countries, and Malaysia. The South American forest resource has been referred to as a "sleeping giant" and is just beginning to be utilized on an expanded commercial scale. How much of this material comes into the north-central region is unknown.

There has been a general decrease in the quality of local hardwood sawtimber such as yellow birch and maple, due to the harvest of larger trees. However, this situation will stabilize and may be expected to reverse as more intensive sustained yield forest management practices are applied to the domestic hardwood resource. For example, the poletimber hardwood resource of Michigan is quite extensive and

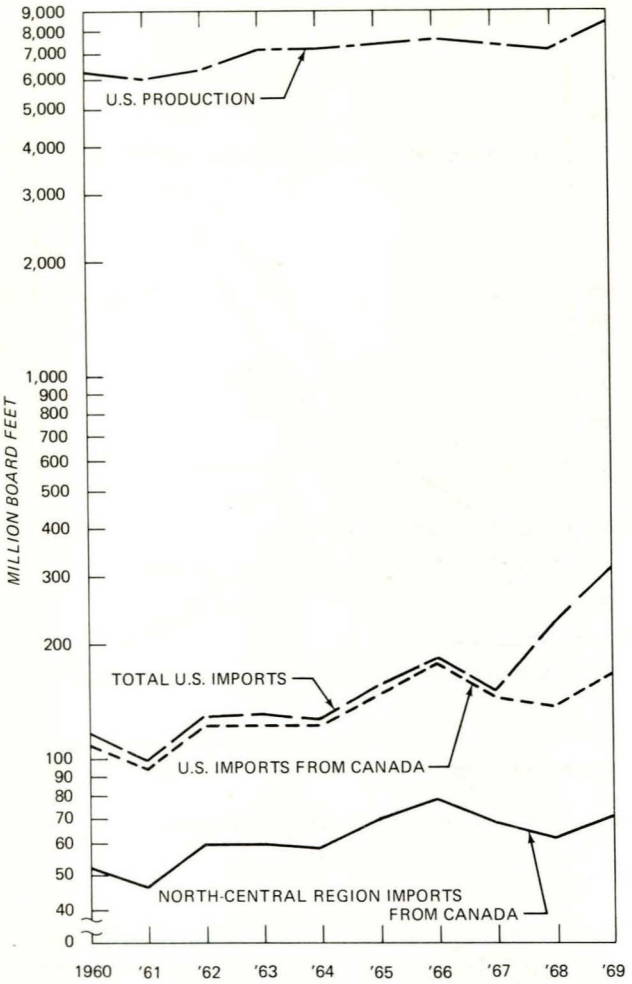

Figure 11. — *Production and imports of hardwood lumber, 1960-1969 (includes rough and dressed lumber only; excludes flooring, drilled or treated lumber, mouldings, and tropical hardwoods). The source for U.S. production is: Current Industrial Lumber Production and Mill Stocks. Ser. M24T. USDC Bureau of the Census, Washington, D.C.*

underutilized. As these trees grow, the sawtimber inventory will increase markedly. In the interim, imports will be vital to the hardwood-using industries of the area.

In 1965, more than 95 percent of the hardwood lumber imports entering the north-central region came through eastern entry points, and 64 percent had first destinations within the region. The sample comprised 10.7 percent of the total regional import volume for 1965.

First destination	*1969 Volume (M bd. ft.)*	*Percent*
Lake States	30,351	42.5
Central States	15,079	21.1
North Central	[45,430]	[63.7]
Other Midwest	10,546	14.8
East	2,419	3.4
South	5,568	7.8
West	7,403	10.4
Total	71,366	100.0

Hardwood Veneer

Based on dollar value, imports from Canada accounted for approximately 47 percent of all U.S. imports of hardwood veneer in 1969, down from 60 percent in 1965. Birch made up 91 percent of these imports, and maple 5 percent.

Birch and maple veneer imports exhibited a general upward trend from 1960 to 1965, then leveled off somewhat (fig. 12). Approximately 78 percent entered through Lake States points. One-third had a first destination in the north-central region, with over one-half destined for California, Washington, and Oregon. The 1965 sample comprised 13 percent of the regional imported volume.

First destination	*1969 Volume (M sq. ft., surface measure)*	*Percent*
Lake States	170,633	30.6
Central States	20,246	3.6
North Central	[190,879]	[34.3]
Other Midwest	4,923	0.9
East	1,795	0.3
South	30,243	5.4
West	329,087	59.1
Total	556,928	100.0

Imports of Canadian veneer may be expected to remain at the same level or increase only slightly as veneer imports from other countries gain a larger market share. Imports may gain a slight advantage over domestic production from the Kennedy Round of tariff adjustments in 1967, which reduced the

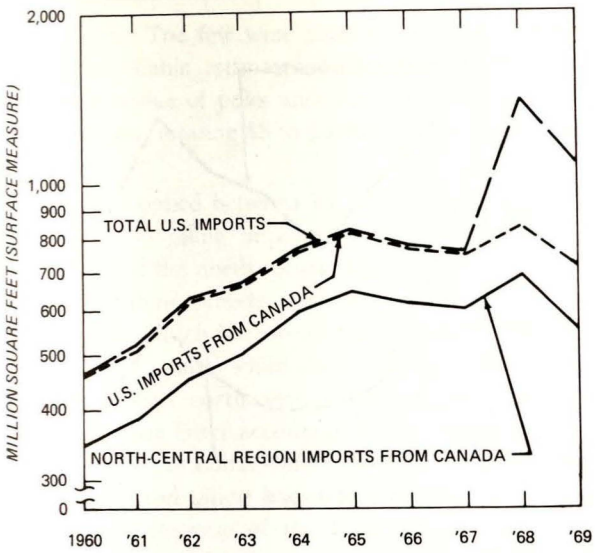

Figure 12. — *Imports of birch and maple veneer, 1960-1969.*

tariff from 8 percent ad valorem prior to 1967 to 4 percent ad valorem in 1972. The bulk of the Canadian imports are destined for the West Coast, and what is utilized in the north-central region simply supplements the local resource.

The Lake States veneer industry has experienced a severe competitive struggle, especially with Asian species and suppliers. However, it appears that other factors are more important in causing a decrease in market share than the quality or availability of the local veneer log resource, which while not available in surplus quantities appears adequate in the face of current market difficulties.

Wood Siding

Prior to 1964 the only siding category was entitled "cedar siding"; since then wood siding has been reported as (1) resawn western redcedar, (2) resawn except western redcedar, (3) western redcedar except resawn, and (4) except western redcedar except resawn. Also, siding that is drilled and/or treated or glued is excluded here and is reported along with other glued, drilled, or treated lumber.

Since 1964, approximately two-thirds of the wood siding imported from Canada was western redcedar, most of which was resawn. The amount that enters the study area from Canada finds wide regional

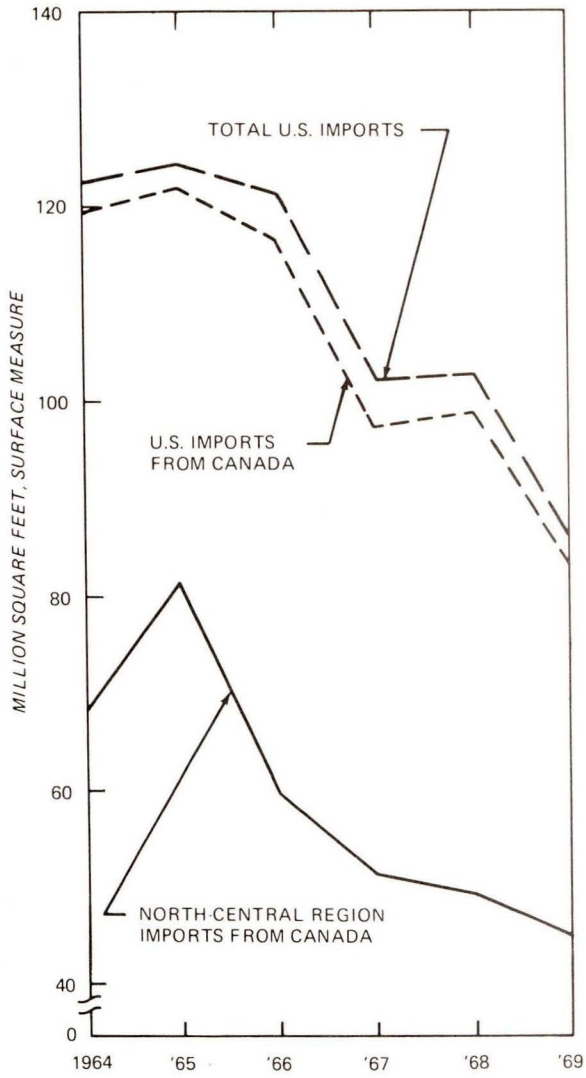

Figure 13. — *Imports of wood siding, 1964-1969.*

distribution; based on the sample of 1965 shipments (which accounted for 4.2 percent of the volume so imported), nearly three-quarters had a first destination within the north-central region. Imports reached a peak in 1965 and have since slowly diminished (fig. 13).

The wood siding market has felt the impact of competition from aluminum, steel, and vinyl as well as hardboard, which may be the reason for the significant decrease in imports of Canadian solid wood siding. The market for Lake States hardwood growing stock material has benefited from the production of hardboard siding. It is not likely that the local forest resource can be more competitive in this declining solid wood siding market.

First destination	1969 Volume (M sq. ft.)	Percent
Lake States	21,541	47.7
Central States	10,391	23.0
North Central	[31,932]	[70.7]
Other Midwest	4,895	10.8
East	4,934	10.9
South	2,937	6.5
West	442	1.0
Total	45,140	99.9

Pulpwood

Prior to 1964 several pulpwood categories used by the Bureau of Customs did not differentiate between softwood and hardwood. In addition, pulpwood import data summarized by the Bureau of Census Foreign Trade Division were given in roundwood bolt volumes as declared by the shipper, while data in the Current Industrial Series (*Pulp, Paper and Board,* published by the Census's Industry Division) also include slabs, chips, and sawmill waste converted to cords of 128 cubic feet — rough-wood basis. Thus, the data are not directly comparable. For example, total U.S. imports of pulpwood in 1966 from the former source amounted to 793,341 cords, and from the latter 1,284,450 cords. Our analysis uses Foreign Trade Division data, which are in cords of 128 cubic feet, deal only with roundwood, and do not specify whether rough or debarked.

Of all U.S. imports of pulpwood since 1964, approximately three-quarters have come from Canada. The remainder is primarily pine from the Bahamas. One-half of the pulpwood imported from Canada is spruce and one-sixth is hardwood.

Forty-five percent of all the pulpwood imported from Canada comes into the north-central region; of this portion, approximately 60 percent is spruce and less than 10 percent is hardwood. A sample (12 percent) of the volume coming into the region in 1965 showed 99.8 percent having a first destination within the Lake States. Chip imports were insignificant during the study period.

Pulpwood imports have decreased substantially during the study period (fig. 14). The decrease has been shared by both softwood and hardwood pulpwood, although softwood has had a somewhat larger

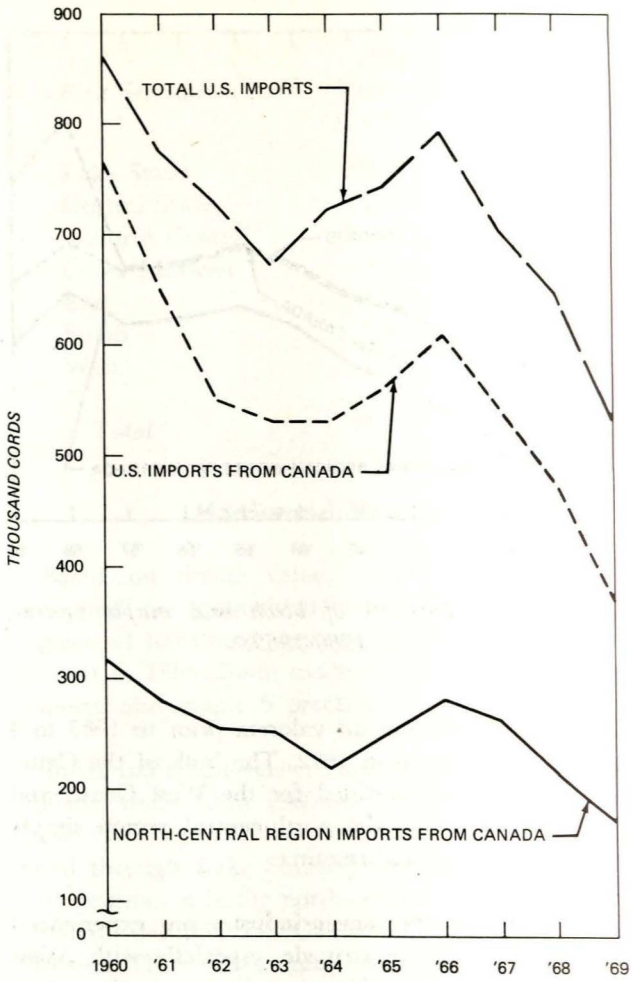

Figure 14. — *Imports of pulpwood, 1960-1969.*

percentage decrease. Coupled with the large increase in softwood sulfate woodpulp imports, it appears the Canadians are shipping a more advanced product in lieu of roundwood. At the same time, the increased use of chipped domestic sawmill and veneer mill residues, the substantial increase in the use of readily available local hardwood pulpwood, and the closing of Lake States sulfite pulpmills undoubtedly has been influential in decreasing roundwood import demands.

Increased utilization of the surplus hardwood pulpwood resource should continue to offer expanded employment opportunities in the Upper Great Lakes region.

Posts, Poles, Piling

The dollar value of fence posts coming into the region has been relatively small, and during the study period represented 10 percent or less of total U.S.

post imports. Too few were picked up in the sample to give a reliable estimate of regional distribution. The dollar value of poles and piling has been significant, however, totaling $3 to $4 million for the period.

Canada supplied between 95 and 98 percent of all U.S. pole and piling imports, of which nearly two-thirds entered the north-central region (fig. 15). Two distinct shipping trends were recognized from the 1965 sample. Much hardwood piling entered through eastern entry points, while softwood poles and piling entered through northwestern regional entry points. Of the two, the latter accounted for an overwhelming proportion of the dollar value. More than 95 percent of the poles and piling had a first destination in the Lake States. Because of the large number of pole-treating plants and pole yards, especially in Minnesota, it is likely that subsequent interregional distribution is made.

Considering the substantial dollar value of pole imports in the "over 15 feet in length" category, local forest resource managers should make every effort to investigate the potential of this market. Red pine and jack pine are the two species that might be competitive. A significant portion of the pole imports are

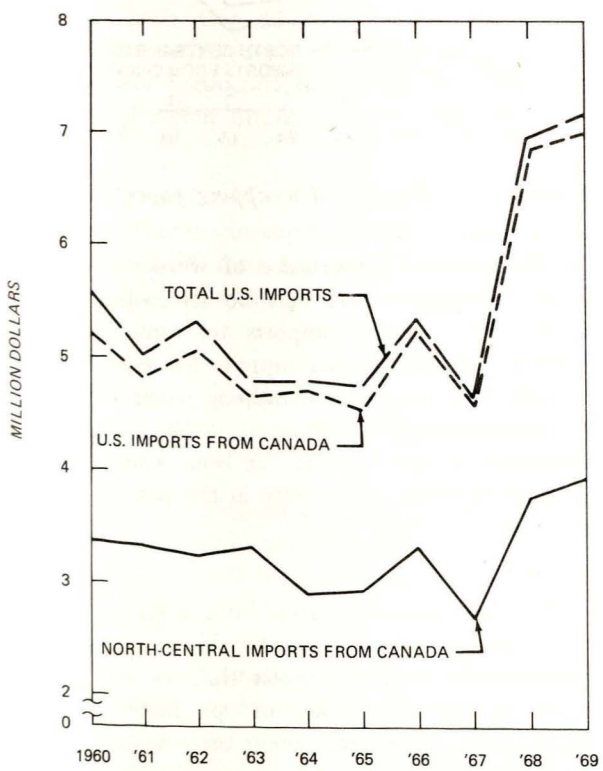

Figure 15. — *Imports of poles and piling, 1960-1969.*

in the 40- to 70-foot length classes, and pole specifications are often detailed concerning sweep, crook, butt diameter, top diameter, and diameter: length ratio.

Building Board

Building board is defined as panels of rigid construction, including tiles and insulation board used chiefly in the construction of walls, ceilings, or other parts of buildings. The category does not include particleboard.

U.S. imports of building board from Canada have amounted to 60 to 87 percent of total U.S. building board imports since 1964, and between 36 and 41 percent of these Canadian shipments entered the north-central region (fig. 16). Import volume peaked in 1964, decreased from 1965 through 1967, then reached new highs in 1968 and 1969.

The 1965 sample comprised 28 percent of the regionally imported volume and indicated that the entire amount had a first destination in the Lake States. This volume in 1969 was 26.0 million square feet, surface measure, valued at $1.7 million.

Building boards offer a definite opportunity for the utilization of Lake States surplus growing stock. Both hardwood and softwood roundwood as well as wood residues are a basic raw material. Although the volume of imports is still relatively small, the increase in imports suggests a potential market may exist for expanded local production.

Wrapping Paper

This category includes papers weighing over 18 pounds per ream that are not cut to size or shape, not surface treated, colored or embossed in any way, and that are used primarily for wrapping purposes.

U.S. imports of wrapping paper from Canada increased during the study period, with approximately three-quarters of the volume coming into the north-central region (fig. 17). While the proportion of wrapping paper imports from Canada has increased from under 10 percent in the early 1960's to over 30 percent in 1969, the bulk of it was supplied by Sweden and Finland. Some of this material may come directly to the north-central region through the St. Lawrence Seaway.

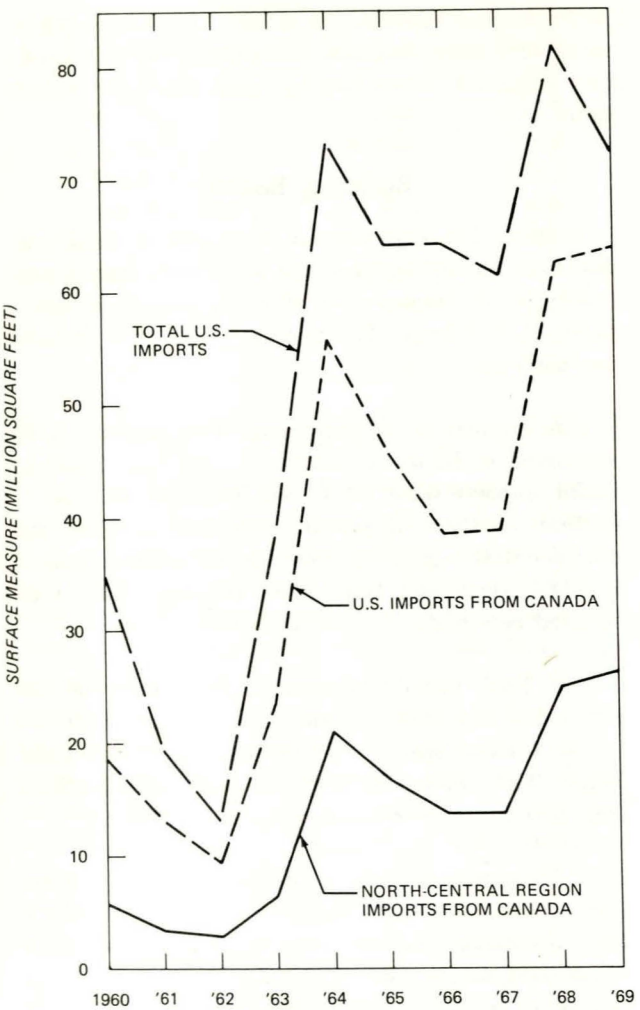

Figure 16. — *Imports of building board, 1960-1969.*

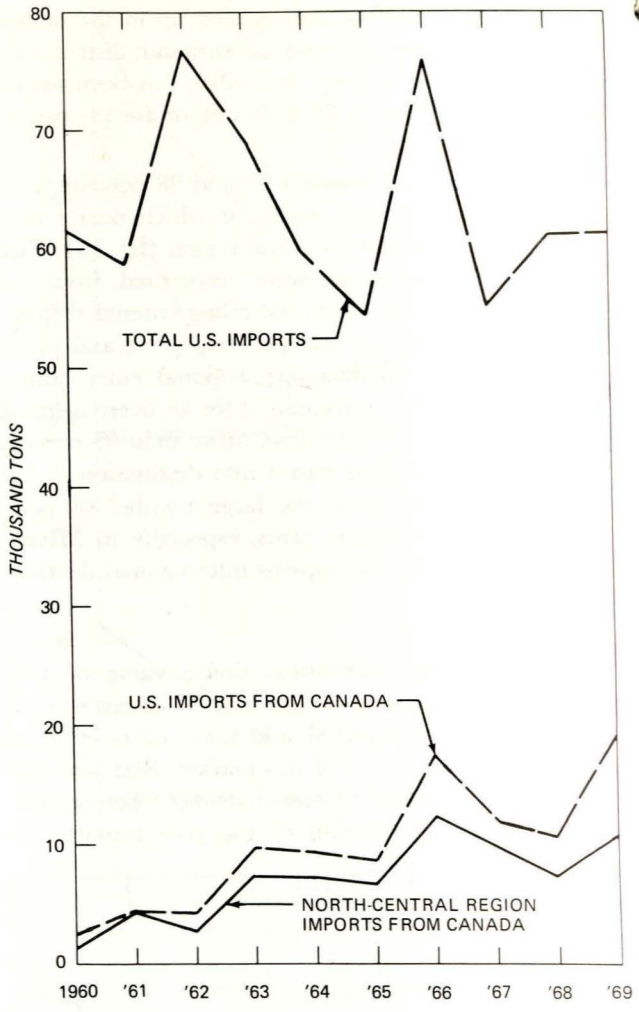

Figure 17. — *Imports of wrapping paper, 1960-1969.*

The following tabulation shows the destination of wrapping paper imported in 1969 estimated from a 16-percent sample of the regional imports from Canada in 1965. (D = data withheld to avoid disclosure of individual company volumes.)

Final destination	*1969 Volume (Tons)*	*Percent*
Lake States	4,686	43.9
Central States	D	—
North Central	D	—
Other Midwest	D	—
East	0	0
South	D	—
West	D	—
Total	10,674	100.0

The potential importance of wrapping paper to Lake States producers may be somewhat disguised when only Canadian imports are considered, as in table 1, because Canada supplies less than one-third of total U.S. imports of wrapping paper (amounting to more than $6.6 million in 1969). What seems important is that Canada has been able to increase its market share significantly in the past 10 years in the U.S.

Wrapping paper is made from a variety of pulp furnishes, but strength and toughness are important qualities. This would suggest that softwood sulfate pulps are most desirable, and production by Lake States mills might again hinge on a successful technology for utilizing hardwood semichemical and sulfate pulps in the furnish.

Hardboard

Hardboard is not defined by density in the tariff schedules, but is categorized as "not face finished" or "face finished." Imports of the latter are minor. The "not face finished" category includes oil treated whether or not regarded as tempered, and is divided into three value classes — under $48 per ton, $48 to $97 per ton, and over $97 per ton. These classes accounted for 2 percent, 87 percent, and 11 percent of the total volume of U.S. imports of "not face finished" hardboard in 1969. The category excludes particleboard and building boards.

Total U.S. imports of hardboard climbed steadily from 1960 through 1965, faltered somewhat in 1966 and 1967, then rose significantly in 1968 and 1969. They have comprised almost 15 percent of U.S production throughout the period. U.S. imports of hardboard from Canada have risen from 6 percent in 1960 to 23 percent in 1969. None came into the north-central region in 1960, while 45 percent did in 1969 (fig. 18).

Imports from Canada have been substantially below those from Sweden and Finland, and some of this European hardboard has come directly to the north-central region through the St. Lawrence Seaway.

A minor influence in imports might be the gradual reduction in tariff rates betwen 1967 and 1972 on hardboard that is not face finished, as follows:

Class (*Dollars/ton*)	*1967 rate*	*1972 rate ad valorem* (*Percent*)
Under 48	15% ad valorem	7.5
48 to 97	$7.25 per short ton	7.5
Over 97	26% ad valorem	15.0

Nearly all the Canadian hardboard coming into the north-central region entered through Michigan points, and most had a first destination in the Lake States or Other Midwest. The sample of 1965 shipments comprised 15 percent of the imported volume.

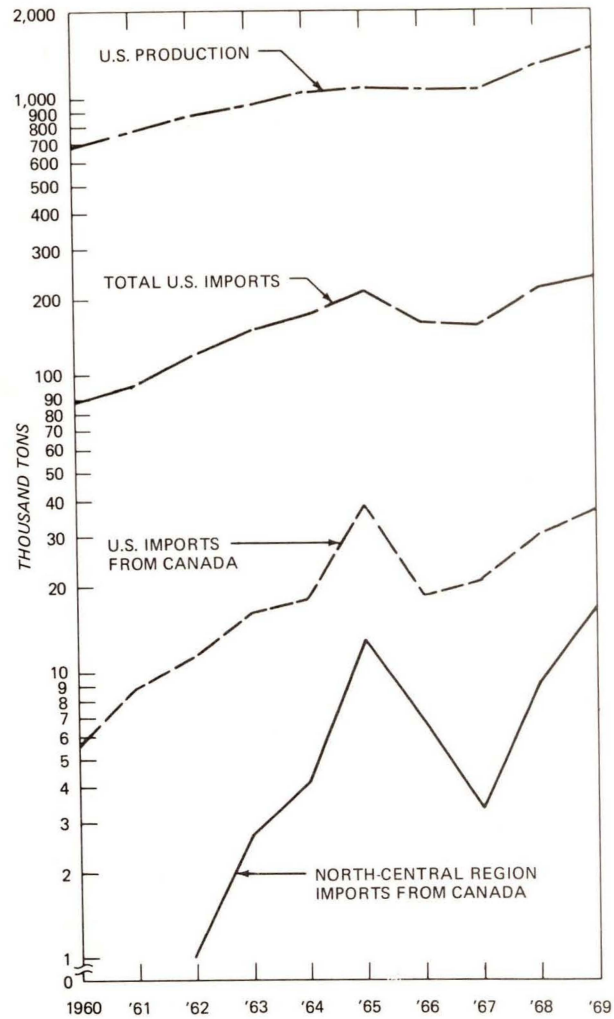

Figure 18. — *Imports of hardboard, 1960-1969. The source for U.S. production is: Current Industrial Report, Pulp, Paper and Board. Ser. M26A-13. USDC Bureau of the Census, Washington, D.C.*

First destination	*1969 Volume (Tons)*	*Percent*
Lake States	6,830	41.3
Central States	2,229	13.5
North Central	[9,059]	[54.8]
Other Midwest	7,288	44.0
East	0	.0
South	0	.0
West	201	1.2
Total	16,548	100.0

Hardboard production has increased in the Lake States during the study period, primarily utilizing the

aspen resource. Import trends for the area indicate further expansion might be possible.

Hardwood Flooring

Significant shipments of hardwood flooring to the U.S. from countries other than Canada began in 1963 (fig. 19). In 1961 shipments from Canada were at the lowest point in the last 15 years, and at that time only 6.8 percent of flooring imports from Canada entered through regional points. This proportion had climbed to more than 40 percent by 1969. All regional flooring imports entered through Michigan in 1969, and maple, birch, or beech strips and planks made up 95 percent of the total.

The estimated distribution for the 1969 volume, based on the 1965 sample which comprised 24 percent of the regional import volume is as follows:

First destination	*1969 Volume (M bd. ft.)*	*Percent*
Lake States	474	16.4
Central States	164	5.7
North Central	[638]	[22.2]
Other Midwest	120	4.2
East	1,110	38.6
South	555	19.3
West	455	15.8
Total	2,878	100.1

Two-thirds of U.S. hardwood flooring imports in 1969 were birch, beech, or maple strips and planks. Oak strips and planks accounted for 5 percent, miscellaneous strips and planks for 15 percent, and hardwood flooring other than strips and planks for 14 percent. Of the birch, beech, and maple imports, 97 percent came from Canada.

At one time birch, beech, and especially maple flooring were used extensively in industrial, institutional, and home construction. The market has declined significantly and is now primarily limited to gymnasium floors and bowling alleys because consumers have turned to other flooring materials.

Two factors that affect the availability of competitively priced rough lumber for domestic flooring mills are furniture demands and railroad tie production. During periods of strong demand for light-colored furniture or early American styles, flooring grade lumber may be diverted to that market. When tie production is down, sideboards, an important source of flooring material, are in short supply. Thus, in the face of a somewhat marginal market the shortage of suitable flooring grade lumber may allow Canadian imports a competitive advantage. This points out that factors other than the forest resource can play an important part in international trade.

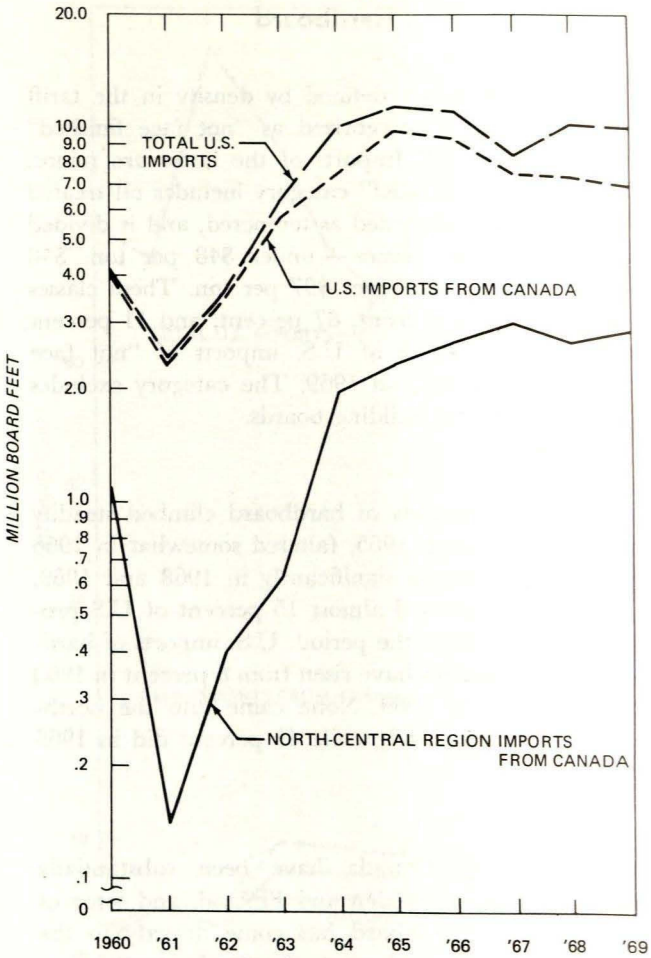

Figure 19. — *Imports of hardwood flooring, 1960-1969.*

Hardwood Plywood and Panels

Imports of Canadian hardwood plywood and veneer panels were much less important than hardwood

veneer.[7] However, Canada supplied only 2 percent of the dollar value of all U.S. hardwood plywood and panel imports in 1969. This was down from 5 percent in 1965. Of a total $248.1 million of imports in 1969, $5 million came from Canada; $4.1 million of this was birch-faced plywood. It is interesting that even for birch plywood, both Japan with $22.2 million and Finland with $20.5 million far exceeded Canadian shipments to the U.S.

Because Canadian shipments of species other than birch as well as veneer panels were relatively insignificant, our analysis is limited to birch-faced plywood. Shipments from Canada reached a peak of nearly 70 million square feet in 1963 and have since steadily declined (fig. 20). Fifty-eight percent of these imports entered through the north-central region, and approximately two-thirds had a first destination there. The 1965 sample comprised 22 percent of the volume of birch plywood entering the region; the distribution pattern was as follows:

First destination	*1969 Volume (Million sq. ft.)*	*Percent*
Lake States	7.3	36.2
Central States	6.1	30.3
North Central	[13.4]	[66.6]
Other Midwest	2.5	12.6
East	—	—
South	3.1	15.5
West	1.1	5.3
Total	20.1	100.0

Canada, Finland, and Japan contributed 99 percent of the birch faced plywood imports in 1969; 40 percent of this was 5/32 inch or less in thickness and 60 percent was over 5/32 inch. Imports from Canada accounted for 16 percent of the thinner category and only 4 percent of the thicker. With total U.S. imports increasing substantially during the study period, it appears the Canadians are having problems similar to the domestic industry in competing in this market. As with veneer, the quality and availability of the local resource are not as important as other factors in limiting production.

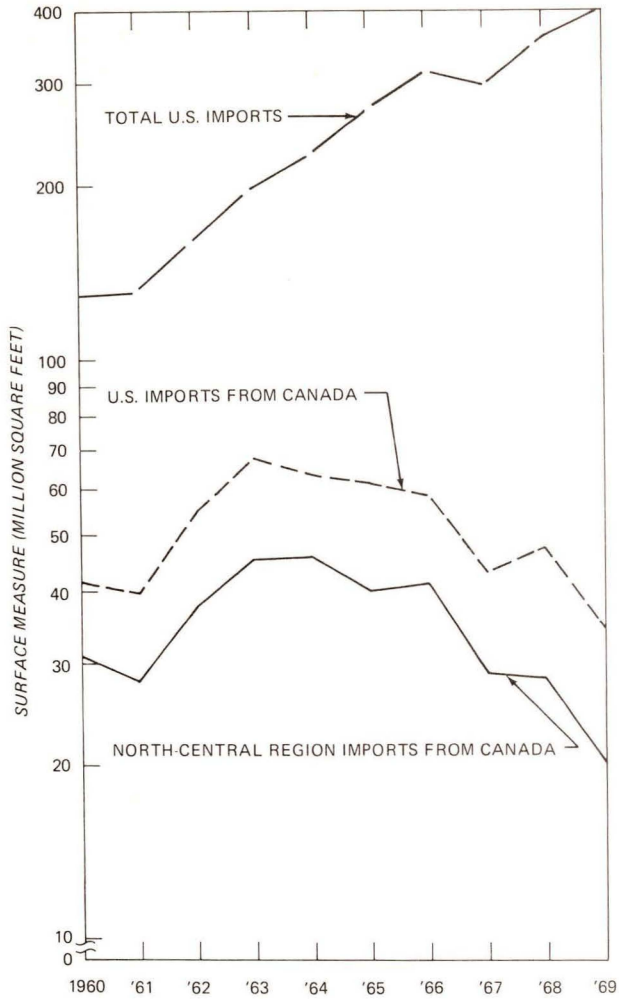

Figure 20. — *Imports of birch plywood, 1960-1969.*

Drilled and/or Treated and Glued Lumber

In 1964 three special categories were established for these materials: (1) drilled and/or treated softwood lumber and siding, (2) edge- or end-glued hardwood lumber, and (3) lumber and wood siding NSPF (not specifically provided for), and end-glued lumber NSPF. These imports are defined as follows:

[7] *Plywood is defined as a rigid wood-veneer assembly bonded with adhesives and having a core of veneer or lumber with one or more plies of wood veneer on each side thereof and in which at least one ply being at an angle with one or more other plies. A wood veneer panel is also a rigid wood-veneer assembly except plywood, bonded with adhesives with a wood veneer ply on one side of a backing, or on both sides of a core which may be of veneer, lumber, hardboard, particleboard, or other material.*

Drilled or treated softwood lumber. — Drilled at intervals for nails, screws, or bolts; sanded or otherwise surface-processed in lieu of, or in addition to, planing and working; or treated with creosote or other wood preservatives or with fillers, sealers, waxes, oils, stains, varnishes, paints or enamels, but not including antistain or other temporary applications.

Glued lumber. — Edge- or end-glued hardwood lumber not over 6 feet in length or over 15 inches in width, not drilled or treated. Edge-glued or end-glued wood over 6 feet in length and not over 15 inches in width that would otherwise meet lumber standards shall be deemed lumber and not included here.

For the softwood lumber and siding category, total U.S. imports from Canada from 1965 to 1969 decreased from 43.9 to 32.2 million board feet (MM bd. ft.) (fig. 21). However the value of these imports rose from $3.7 million to $4.4 million. For glued hardwood imports, both volume and value increased, rising from 1.5 MM bd. ft. and $0.7 million to 3.3 MM bd. ft. and $1.6 million (fig. 22). The NSPF

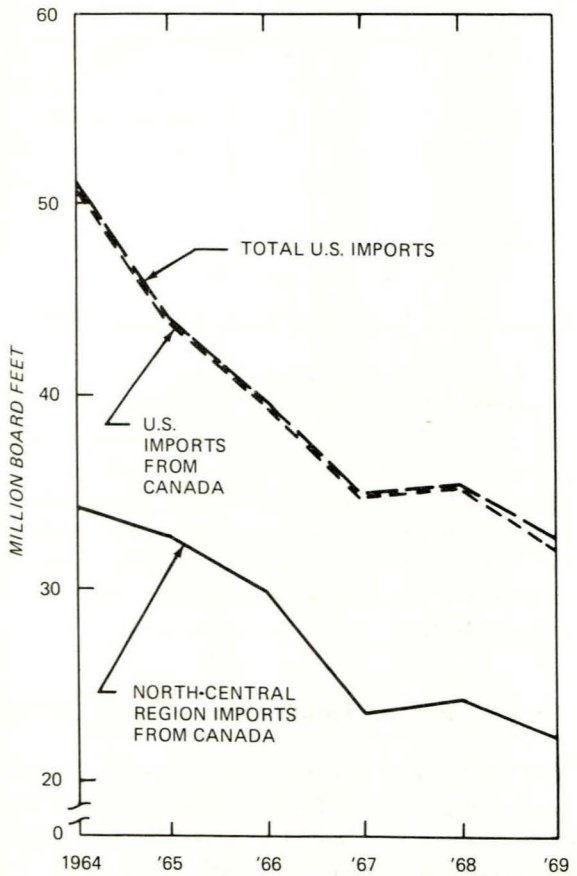

Figure 21. — *Imports of drilled and/or treated softwood lumber and siding, 1964-1969.*

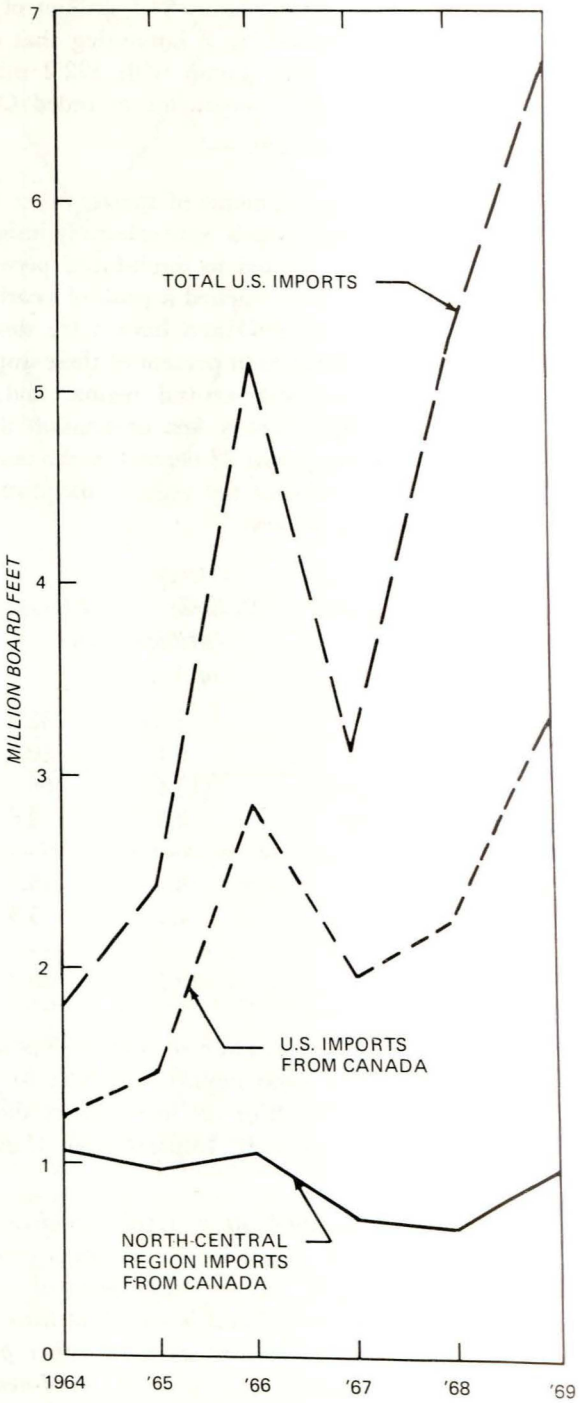

Figure 22. — *Imports of edge- or end-glued hardwood lumber and siding, 1964-1969.*

category was relatively insignificant in volume and value.

Only drilled and/or treated softwood lumber and siding was included in the 1965 sample of north-central region imports, and siding was a minor portion of these shipments. The following data relate only to this category. A steadily downward trend since 1964 culminated in 22,587,000 bd. ft. shipped into the region in 1969. Based on the sample (which comprised 5.6 percent of the volume imported), the material was distributed as follows:

First destination	*1969 Volume (M bd. ft.)*	*Percent*
Lake States	8,137	36.0
Central States	4,093	18.1
North Central	[12,230]	[54.1]
Other Midwest	3,471	15.4
East	2,720	12.0
South	3,527	15.6
West	639	2.8
Total	22,587	99.9

A high proportion of these imports was thick, predrilled roof decking for use in construction where the inner surface is exposed as the finished roof. Several species are used, including white spruce and western redcedar. This is an architectural specialty item often shipped on special order and which might require promotion by local mills.

Birch and Maple Logs

Because birch and maple logs generally represent over 95 percent of hardwood log imports from Canada, our study is limited to this category. Excluded are the categories Cativo, Mahogany, Lauan, and Logs NES, of which only the latter includes a relatively small amount of miscellaneous species from Canada. Also, data prior to 1964 are excluded because changes in categories make them inconsistent with later years.

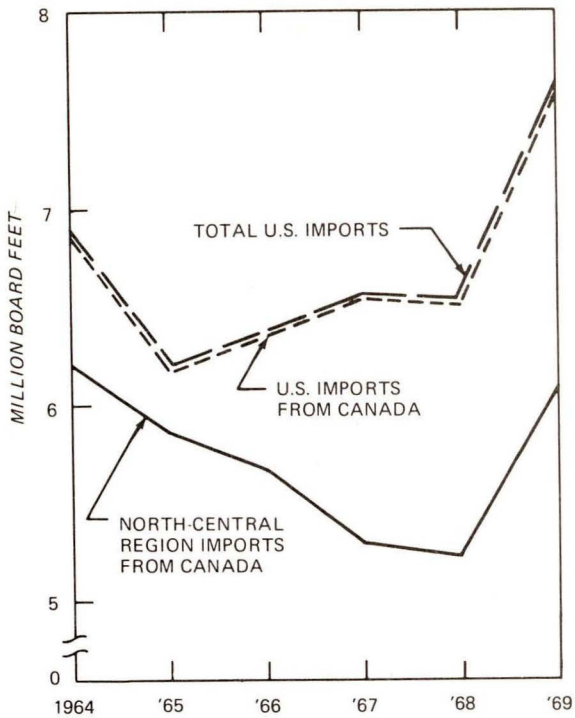

Figure 23. — *Imports of birch and maple logs, 1964-1969.*

From 1964 to 1966 more than 90 percent of imported maple and birch logs came through Lake States ports of entry; this figure dropped to 80 percent in 1967 and has stayed there ever since. Import trends were slightly downward throughout the study period but recovered well in 1969, amounting to 6 MM bd. ft. (fig. 23).

The sample of 1965 log imports comprised 19 percent of the total regional import volume Most of the logs were of veneer quality and nearly all entered through Michigan border points. Based on the sample, 88 percent had a first destination in the Lake States and 12 percent went to the Central States. These imports have been an important supplement to the regional veneer log resource. Regional imports of softwood logs were insignificant.

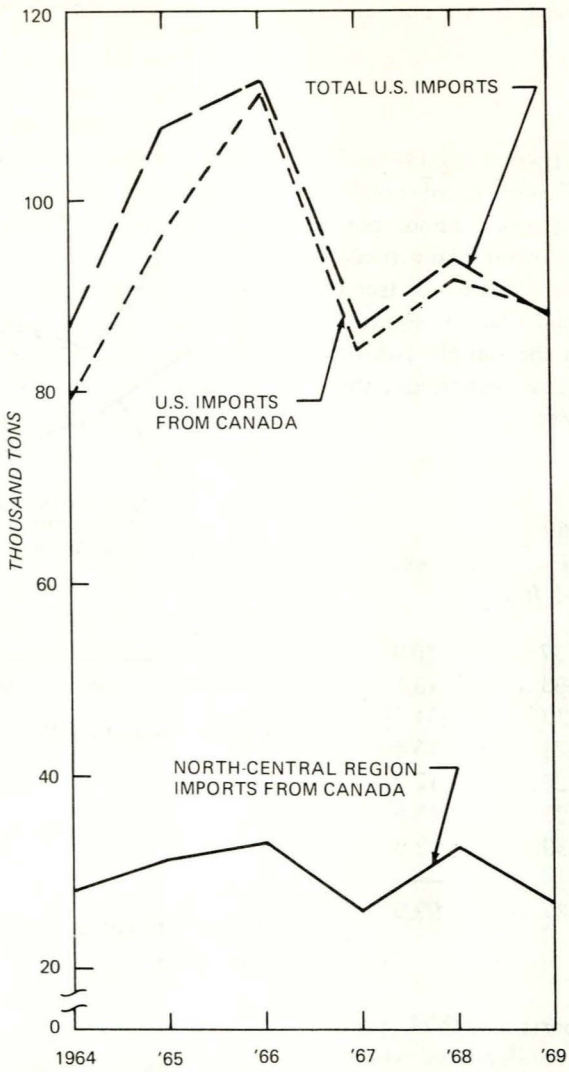

Figure 24. — *Imports of scrap paper, 1964-1969.*

Scrap Paper

Regional imports of scrap paper have held rather steady since 1964 when the category was initiated (fig. 24). More than 80 percent have a first destination in the Lake States with most of the balance destined for the Other Midwest and West. In the future this category may be influenced by the pressure for recycling wastes and the requirement by some organizations that certain paper products contain a proportion of salvaged fiber.

First destination	*1969 Volume (Tons)*	*Percent*
Lake States	22,160	81.9
Central States	219	.8
North Central	[22,379]	[82.7]
Other Midwest	2,140	7.9
East	0	.....
South	0	.....
West	2,548	9.4
Total	27,067	100.0

☆ U.S. Government Printing Office: 1972 – 760-995

SOME RESEARCH PAPERS OF THE NORTH CENTRAL FOREST EXPERIMENT STATION

Storm Flow from Dual-Use Watersheds in Southwestern Wisconsin, by Richard S. Sartz. USDA For. Serv. Res. Pap. NC-69, 7 p., illus. 1971.

Annotated Bibliography of Walnut — Supplement No. 1, by Martha K. Dillow and Norman L. Hawker. USDA For. Serv. Res. Pap. NC-70, 23 p. 1971.

Fire Whirlwind Formation Over Flat Terrain, by Donald A. Haines and Gerald H. Updike. USDA For. Serv. Res. Pap. NC-71, 12 p., illus. 1971.

The Changing Hardwood Veneer and Plywood Industry of Michigan and Wisconsin, by Gary R. Lindell and Lewis T. Hendricks. USDA For. Serv. Res. Pap. NC-72, 8 p., illus. 1972.

Estimating Force & Power Requirements for Crosscut Shearing of Roundwood, by Rodger A. Arola. USDA For. Serv. Res. Pap. NC-73, 8 p., illus. 1972.

Effect of Topography on Microclimate in Southwestern Wisconsin, by Richard S. Sartz. USDA For. Serv. Res. Pap. NC-74, 6 p., illus. 1972.

Weights and Centers of Gravity for Red Pine, White Spruce, and Balsam Fir, by H. M. Steinhilb and John R. Erickson. USDA For. Serv. Res. Pap. NC-75, 7 p., illus. 1972.

Fire Weather and Behavior of the Little Sioux Fire, by Rodney W. Sando and Donald A. Haines. USDA For. Serv. Res. Pap. NC-76, 6 p., illus. 1972.

Canoeist Suggestions for Stream Management in the Manistee National Forest of Michigan, by Michael J. Solomon and Edward A. Hansen. USDA For. Serv. Res. Pap. NC-77, 10 p., illus. 1972.

The Changing Market for Hardwood Plywood Stock Panels, by Gary R. Lindell. USDA For. Serv. Res. Pap. NC-78, 7 p., illus. 1972.

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- Conducting forest and range research at over 75 locations ranging from Puerto Rico to Alaska to Hawaii.
- Participating with all State forestry agencies in cooperative programs to protect, improve, and wisely use our Country's 395 million acres of State, local, and private forest lands.
- Managing and protecting the 187-million acre National Forest System.

The Forest Service does this by encouraging use of the new knowledge that research scientists develop; by setting an example in managing, under sustained yield, the National Forests and Grasslands for multiple use purposes; and by cooperating with all States and with private citizens in their efforts to achieve better management, protection, and use of forest resources.

Traditionally, Forest Service people have been active members of the communities and towns in which they live and work. They strive to secure for all, continuous benefits from the Country's forest resources.

For more than 60 years, the Forest Service has been serving the Nation as a leading natural resource conservation agency.